

## CLAIMS

What is claimed is:

1. A method implemented in a mobile terminal for establishing communications with a base unit in a cordless phone system, said method comprising:

- 5 storing a reference location associated with said base unit in said mobile terminal;  
determining a current location of said mobile terminal;  
computing a distance between said current location of said mobile terminal and said  
base unit;  
conducting a search for said base unit to establish communication with said base unit;  
10 and  
controlling searching for said base unit based on said distance between said current  
location of said mobile terminal and said base unit by varying a search behavior of  
said mobile terminal dependent upon said distance between said current location  
of said mobile terminal and said base unit.

2. The method of claim 1 wherein varying a search behavior of said mobile terminal  
dependent upon said distance between said current location of said mobile terminal and said  
base unit comprises varying the frequency of said search.

3. The method of claim 1 wherein varying a search behavior of said mobile terminal  
dependent upon said distance between said current location of said mobile terminal and said  
base unit comprises varying the duration of said search.

4. The method of claim 1 wherein storing a reference location associated with said base unit comprises:

determining the current location of said mobile terminal when communication with said base unit is established; and

5 storing said current location of said mobile terminal when communication with said base unit is established as said reference location.

5. The method of claim 1 wherein storing a reference location associated with said base unit comprises:

10 determining the current location of said mobile terminal; and

storing said current location of said mobile terminal in response to user input as said reference location.

6. The method of claim 1 wherein storing a reference location associated with said base unit comprises inputting said reference location by a user.

7. The method of claim 1 wherein storing a reference location associated with said base unit comprises storing said reference location in a removable smart card.

20 8. The method of claim 1 further comprising updating said reference location stored in said mobile terminal following a change in said reference location.

9. The method of claim 8 wherein updating said reference location stored in said mobile terminal following a change in said reference location comprises:

determining the current location of said mobile terminal when communication with said  
base unit is established;

comparing said current location of said mobile terminal to said stored reference location  
to detect a change in said reference location; and

5 if a change in said reference location is detected, storing said current location in said  
mobile terminal as an updated reference location.

10. The method of claim 9 further comprises notifying a user when a change in said  
reference location is detected by said mobile terminal.

10 11. The method of claim 10 wherein updating said reference location stored in said mobile  
terminal following a change in said reference location further comprises prompting the user to  
accept a change in said reference location stored in said mobile terminal.

15 12. The method of claim 8 wherein updating said reference location stored in said mobile  
terminal following a change in said reference location comprises:  
determining the current location of said mobile terminal in response to user input; and  
storing said current location of said mobile terminal determined in response to said user  
input as an updated reference location.

20 13. The method of claim 1 wherein controlling searching for said base unit based on said  
distance between said current location of said mobile terminal and said base unit comprises  
determining a threshold for varying said search behavior.

14. The method of claim 13 wherein determining said threshold comprises defining a boundary of a home area containing said reference location, wherein said boundary serves as said predetermined threshold.

5 15. The method of claim 14 wherein defining a boundary of a home area containing said reference location comprises setting said boundary in response to user input.

16. The method of claim 15 wherein defining a boundary of a home area containing said reference location comprises:

10 determining the current location of said mobile terminal at a plurality of time instants when communication with said base unit is established; and  
determining said boundary of said home area based on said current location of said mobile terminal at said plurality of time instants.

15 17. The method of claim 1 further comprising determining a position update frequency based on said distance between said current location of said mobile terminal and said reference location.

18. The method of claim 17 wherein determining said position update frequency based on  
20 said distance between said current location of said mobile terminal and said reference location comprises increasing said update frequency as said distance between said current location of said mobile terminal and said reference location decreases.

19. The method of claim 17 wherein determining a position update frequency based on said distance between said current location of said mobile terminal and said reference location comprises decreasing said update frequency as said distance between said current location of said mobile terminal and said reference location increases.

20. The method of claim 17 further comprising determining the velocity of said mobile terminal based on two or more position estimates.

21. The method of claim 20 wherein determining said position update frequency based on said distance between said current location of said mobile terminal and said reference location further comprises determining said position update frequency as a function of said distance between said current location and said reference location and said velocity of said mobile terminal.

22. The method of claim 21 wherein determining said position update frequency as a function of said distance between said current location of said mobile terminal and said reference location and said velocity of said mobile terminal comprises increasing said position update frequency as said velocity increases and decreasing said position update frequency as said velocity decreases.

23. The method of claim 1 further comprising updating said current position of said mobile terminal when communication with said base unit is established.

24. The method of claim 23 wherein updating said current position of said mobile terminal when communication with said base unit is established comprises notifying a user if said current position cannot be determined.

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25. A dual function mobile terminal compatible with a cordless phone system comprising:  
a positioning receiver to compute a current location of said mobile terminal;  
a short-range RF interface to communicate with a base unit in said cordless phone  
5 system when said mobile terminal is within the range of said base unit and to  
search for said base unit when said mobile terminal is out of range of said base  
unit;  
a processor to compute the distance between said current location of said mobile  
terminal and a stored reference location for said base unit and to control a search  
10 behavior of said short-range interface based on said computed distance.
26. The mobile terminal of claim 25 wherein said short-range RF interface periodically  
searches for said base unit with a predetermined search frequency.
- 15 27. The mobile terminal of claim 26 wherein said processor controls said search behavior of  
said RF interface by varying said search frequency based on said distance between said current  
location of said mobile terminal and said base unit.
28. The mobile terminal of claim 25 wherein said processor is programmed to store said  
20 current location as said reference location when said RF interface has established  
communication with said base unit.
29. The mobile terminal of claim 25 wherein said mobile terminal further comprises a user  
interface and wherein said processor is programmed to store said current location as said  
25 reference location in response to user input via said user interface.

30. The mobile terminal of claim 25 wherein said mobile terminal further comprises a user interface and wherein said processor is programmed to store as said reference location a location input by a user via said user interface.

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31. The mobile terminal of claim 25 wherein said processor is programmed to update said reference location when said processor detects a change in the location of said base unit.

32. The mobile terminal of claim 31 wherein said processor detects a change in the location of said base unit by determining said current location of said mobile terminal upon mating with said base unit and comparing said current location upon mating with said base unit to a previously-stored reference location for said base unit.

33. The mobile terminal of claim 32 wherein said mobile terminal further comprises a user interface and wherein processor notifies the user via said user interface when said processor detects a change in said reference location.

34. The mobile terminal of claim 33 wherein said processor prompts the user via said user interface to accept a change in said reference location when said processor detects a change in said reference location.

35. The mobile terminal of claim 34 wherein said processor updates said current location of said mobile terminal as an updated reference location in response to user input via said user interface.

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36. The mobile terminal of claim 25 wherein the processor is programmed to define a boundary of a home area containing said reference location, said processor using said boundary to control a search behavior of said RF interface.

5 37. The mobile terminal of claim 36 wherein said mobile terminal further comprises a user interface and wherein said processor is programmed to define said boundary in response to input from the user via said user interface.

38. The mobile terminal of claim 36 wherein said processor is programmed to define said  
10 boundary containing said reference location by determining said current location of said mobile terminal when said RF interface establishes communication with said base unit.

39. The mobile terminal of claim 25 wherein said processor determines a position update  
15 frequency based on said distance between said current location of said mobile terminal and said reference location.

40. The mobile terminal of claim 39 wherein said processor is further programmed to  
increase said update frequency as said distance decreases between said current location of  
said mobile terminal and said reference location.

20 41. The mobile terminal of claim 39 wherein said processor is further programmed to  
decrease said update frequency as said distance increases between said current location of  
said mobile terminal and said reference location.

42. The mobile terminal of claim 39 wherein said processor is programmed to determine the velocity of said mobile terminal by computing the difference in two or more of said position estimates.

5 43. The mobile terminal of claim 42 wherein said processor is further programmed to determine said position update frequency as a function of said distance between said current location of said mobile terminal and said reference location, and as a function of said velocity of said mobile terminal.

10 44. The mobile terminal of claim 43 wherein said processor is programmed to determine said position update frequency as a function of said distance between said current location of said mobile terminal and said reference location and as a function of said velocity of said mobile terminal; said processor is further programmed to increase said position update frequency as said velocity increases; said processor is further programmed to decrease said position update  
15 frequency as said velocity decreases.

45. A system to permit communication of a wireless mobile terminal with the public switched telephone network comprising:

a public land mobile network;

5 a private cordless base unit connected to the public switched telephone network in the same manner as a conventional corded telephone;

a mobile terminal comprising:

a positioning receiver to compute a current location of said mobile terminal;

a short-range RF interface to communicate with a base unit in said cordless

10 phone system when said mobile terminal is within the range of said base

unit and to search for said base unit when said mobile terminal is out of

range of said base unit;

a processor to compute the distance between said current location of said mobile terminal and a stored reference location for said base unit and to control a search behavior of said short-range interface based on said computed distance.

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